



## **INVGuild: bridging taxonomic and functional data for invertebrate biodiversity surveys**

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Soil invertebrates play a crucial role in maintaining ecosystem services and functioning of terrestrial ecosystems. Monitoring biodiversity is therefore essential to assess ecosystem status and identify potential threats. While the presence of specific taxa provides insights into soil biological quality, evaluating their functional roles allows a deeper understanding of ecosystem conditions.

A promising approach for studying organisms' functional roles is the classification of taxa into trophic guilds that serve as proxies for actual ecological roles. However, this remains underexplored for soil invertebrates, whose ecological roles are often poorly understood. To fill this gap, the present study aims to develop a database linking taxonomic and trophic guild information for European soil invertebrates. This is achieved by synthesizing available literature on the trophic ecology of invertebrates in European soils, with the goal of providing a tool for studying the diversity and functionality of soil ecosystems.

The database includes soil invertebrate taxa identified within major molecular studies on the European soil fauna. Trophic guilds were assigned through an extensive literature review. Data from the LUCAS project were also used to validate the database and to compare the proposed functional approach with traditional taxonomic characterization of soil diversity.

The results suggest that classifying taxa into trophic guilds provides a more dynamic representation of ongoing ecological processes and enables analysis of key trophic network features, such as interactions among trophic levels and the degree of omnivory. The database currently includes approximately 1,000 taxa classified into trophic guilds. The resource will soon be made publicly available and will remain open to contributions from specialists, ensuring continuous updates.

INVGuild can strongly support DNA metabarcoding studies by allowing the classification in terms of trophic guilds of many taxa, enabling a more comprehensive assessment of ecosystem status and informing management decisions aimed at maintaining ecosystem health and resilience.